

What Is Claimed Is:

1. An optical router which is disposed on an optical node basis, selects optical paths for optical signals that are transmitted through such optical transmission lines as optical fibers, and outputs said optical signals through said optical paths, whereby an optical communications network is formed, said optical router comprising:

optical delay means for delaying a plurality of said optical signals containing routing information attached to the header parts thereof by an optical signal delay time;

an optical switch provided with a plurality of input ports whereto a plurality of optical outputs of said optical delay

means are input and with a plurality of output ports wherefrom

said optical signals are output;

an optical-electrical converter for converting a plurality
of said optical signals to electrical signals;

memory wherein path control information and delay time
information are stored; and

a controller for generating an electrical routing control
signal whereby to change the optical paths of said optical
signals by finding said path control information according
to said routing information extracted from the output of said
optical-electrical converter and for delaying said
electrical routing control signal by an electrical signal
delay time determined according to said delay time information
before outputting said electrical routing control signal to

said optical switch.

2. The optical router of claim 1, wherein said controller is comprised of:

header recognition means for extracting said routing information;

searching means for finding said path control information and generating said electrical routing control signals used to change the optical paths of said optical signals;

a delay time adjuster for delaying said electrical routing control signals by an electrical signal delay time determined according to said delay time information; and

a switching controller for outputting said electrical routing control signals to said optical switch to determine

an optical path.

3. The optical router of claim 1 or 2, wherein said controller or said delay time adjuster determines said electrical signal delay time by subtracting a time length, which has been determined according to said delay time information and is just long enough for processing electrical signals, from said optical signal delay time.

4. The optical router of claim 1 or 2, wherein said optical delay means is configured so that said optical signal delay time can be varied in integer-multiple increments of a specific time length as controlled by said controller or said delay time adjuster.

5. The optical router of claim 1 or 2, wherein said controller or said delay time adjuster adds a time length to said optical signal delay time according to priority information attached to said optical signals in order to lengthen the delay time thereof.

6. The optical router of claim 5, wherein said priority information is attached to the header parts of said optical signals.

7. The optical router of claim 1 or 2, wherein said controller or said delay time adjuster updates said delay time information stored in said memory according to new delay time

information attached to said optical signals.

8. The optical router of claim 7, wherein said new delay time information is attached to the header parts of said optical signals.

9. The optical router of claim 1 or 2, wherein said optical delay means is comprised of:

optical loops of optical fibers; and

optical switches for inputting said optical signals to said optical loops or outputting said optical signals from said optical loops, as controlled by said controller or said delay time adjuster.

10. The optical router of claim 1 or 2, wherein said optical

delay means is comprised of:

the optical loops of a plurality of optical fibers having
different optical fiber lengths;

a plurality of optical switches for inputting said optical
signals to said optical loops or outputting said optical
signals from said optical loops, as controlled by said
controller or said delay time adjuster; and

a second optical switch for selecting one optical loop from
a plurality of said optical loops.

11. The optical router of claim 1 or 2, wherein said optical

delay means is comprised of:

the optical loops of a plurality of optical fibers having

different optical fiber lengths; and

a plurality of optical switches for inputting said optical signals to said optical loops or outputting said optical signals from said optical loops, as controlled by said controller or said delay time adjuster;

wherein said optical loops and said optical switches are respectively connected in series.